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Soil & Water Conservation News

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3	Comments from the Chief
4	News Briefs
13	RCA Update
14	Management Tips
15	Conservation Research Roundup
16	Meetings



Country Music Star Records Public Service Messages

by E. Joseph Larson

Loretta Lynn, the first lady of country music, is selling soil conservation from coast to coast through a series of public service radio spots she recorded for the Soil Conservation Service.

This is the first time Miss Lynn has taped public service spots for any organization. She said she seldom does commercials for radio or television because she won't advertise anything she doesn't believe in 100 percent.

She believes in soil conservation. And she donated about 4 hours of her time to do the spots out of appreciation for the technical help she and her husband, Mooney Lynn, have received from SCS through the Humphreys County Soil Conservation District in Tennessee.

The Lynns have a 3,500-acre ranch located at Hurricane Mills, Tenn., about 70 miles west of Nashville. Mooney, who manages the ranch, has been a very active cooperator in the district since 1973.

The radio spots were recorded in April by SCS at the ranch. This was the first time Loretta Lynn had been home since Christmas, and she left the next day for California to receive the country singer of the decade award on national television.

Demands on Miss Lynn's time have been great, not just because of her singing talent, but also because of the tremendous success of the recent motion picture that tells the story of her life.

Mooney plants about 1,400 acres to corn and soybeans and rotates the crops to control weeds. To reduce the threat of erosion, he seeds by air a winter cover crop on the soybean fields when the plants begin to lose their leaves.

His steeper land is in hay, pasture, and timber. He is sold on no-till farming, which he said not only reduces erosion but also saves energy and time.

The Lynns are sincere in their conservation effort and in improving farming conditions throughout their area of the State.

Four years ago they teamed up with the University of Tennessee to carry out research demonstrations on soil fertility, weed control, and other cultural practices that could benefit many farmers.

The radio spots Loretta Lynn recorded are being distributed to 5,000 radio stations throughout the country by SCS district conservationists.

E. Joseph Larson,
public information officer, Information and
Public Affairs, SCS, Washington, D.C.

Chinese Tour U.S. Agriculture

As the first step in an official agricultural exchange between the U.S. Department of Agriculture (USDA) and the People's Republic of China (PRC), seven delegates of the PRC's soil and water management study team arrived in Washington, D.C., on May 22 from Peking, China. The delegation toured agricultural practices in seven States—Maryland, Tennessee, Mississippi, Iowa, California, Arizona, and Colorado. USDA hosts of the tour included the Soil Conservation Service (SCS), the Science and Education Administration-Agricultural Research (SEA-AR), and the Forest Service (FS). Also involved were the U.S. Army Corps of Engineers, State agencies, conservation districts, and individual farmers.

The delegation was particularly interested in water resource management, including flood control, reducing sedimentation, controlled irrigation, drainage, and terrace systems.

In Maryland, Gerald R. Calhoun, SCS State conservationist, guided the Chinese visitors on a tour of: the new town of Fort Lincoln in the District of Columbia to see sediment control and storm water management practices; the National Plant Materials Center at Beltsville, Md., to see how conservation plants are tested for field use; a housing development in Anne Arundel County to see a sediment basin and storm water management pond; and the Army Corps of Engineers' Chesapeake Bay model near Annapolis. The Corps uses the replica to study hydrodynamic processes of the bay.

One of the Chinese visitors, a

Continued on next page.

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Chinese Tour, cont.

senior engineer, was so impressed by the 8-acre replica of the bay that he slipped away from the tour to study intricate model designs with Corps engineers in their office. He said he was proposing a similar model to Chinese officials and wanted to get more details on the Corps' model.

In Tennessee, the group toured the Sweetwater Creek Watershed Project, the Athens Mini-park, the Rural Abandoned Mine Program reclamation site in the city of Sparta, and the Save Our Soil Demonstration Project in West Tennessee. The visitors agreed that the climate and topography of much of China is similar to that of West Tennessee. The Tennessee Department of Agriculture, the University of Tennessee, conservation district supervisors, and the Tennessee Valley Authority also participated in the Chinese delegation's 3-day visit.

In Mississippi, the group toured the SEA-AR sedimentation laboratory and the FS hydrology laboratory. They surveyed catfish hatcheries, processing plants, and a catfish feed mill, and they observed crawfish and rice growing in the same field on a district cooperator's farm.

Land leveling and irrigation were the star attractions in Leflore County. Large farm equipment commonplace in the Delta made a big hit with the Chinese visitors, according to C. H. Whittington, SCS area conservationist. The Chinese said large equipment is practically unknown in China.

In Bolivar County, where they inspected watershed channel work, streambank treatment, and ditches, the delegation expressed surprise at the amount of input by local people into the flood prevention program. At the Army Corps of Engineers Wa-

terways Experiment Station, the group learned how the Corps conducts channel erosion studies, and they surveyed Mississippi River flood control methods.

In Iowa, the delegation showed particular interest in the Corps' control of river flow for barge traffic and the hydroelectric generating plant on the Missouri River. They were also interested in the Corps' ability to monitor daily weather conditions, rainfall, and runoff and in the storage of water in the Corps' six major reservoirs in the Missouri River Basin.

In the North Pigeon watershed area in the West Pottawattamie Soil Conservation District, the group viewed land treatment practices including grassed backslope terraces, grassed waterways, diversion terraces, no-till cropping systems, and structures to stabilize gullies.

An hour before the tour, a 2½-inch rain had fallen on the watershed and filled the level terraces. The Chinese were particularly interested to see the terrace system in operation because they have heavy siltation along and in the Yellow River.

In California, following a visit to Disneyland, the group moved on to the more serious business of irrigation and water conservation operations. Stops included the Rain Bird irrigation plant, SEA-AR salinity lab, and drip irrigation systems in avocado orchards planted on Class VII land.

Looking at irrigation and drainage in the heart of California's Imperial Valley, the group quizzed SCS District Conservationist Wayne Flanagan about the laser-controlled tiling machines that dig trenches and install plastic pipe in one continuous operation. Noting that one section of China was similar to the Imperial Valley, the group moved on to tour Imperial Irri-

gation District headquarters to learn about movement of water from the Colorado River to the Imperial Valley.

In Colorado, the delegation and tour hosts viewed slide programs on irrigation water salinity problems in China and along the Colorado River. The group witnessed a new phenomenon in Colorado—35 acres of drip irrigated grapes. At the Colorado State University Experiment Farm, the delegation studied methods of controlled irrigation such as measuring water flow to determine efficiency of irrigation systems.

Returning to California from a brief visit to Arizona and a low-level flight up the Colorado River, the group inspected California's water management plan, including dams, pumping plants, and delta management.

Following a weekend of sightseeing in San Francisco, the group returned to China by way of Tokyo, Japan, on June 23.

An American agricultural study team expects to visit China this fall.

Volcanic Ash Analyzed

Volcanic ash deposits could create a few isolated salinity problems in drier areas of the Pacific Northwest, but should produce long-term benefits on land in humid areas.

A preliminary study of ash samples from eastern Washington following the eruption of Mount Saint Helens revealed no higher concentrations of most potentially toxic elements than in ordinary farmlands.

The Soil Conservation Service's National Soil Survey Laboratory found the ash samples contained less lead and cadmium than most soils and only small amounts of fluorides.

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Secretary of Agriculture

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Comments: from the SCS Chief

In June, President Carter signed a bill into law which extends the Great Plains Conservation Program (GPCP) from December 31, 1981, to September 30, 1991. This new legislation, Public Law 96-263, increases the total GPCP funding authorization from \$300 million to \$600 million and raises the yearly cost-share limitation from \$25 million to \$50 million.

The Soil Conservation Service has administered GPCP since the program began in 1956. Through the program, working together with conservation districts, SCS has been able to give technical and financial assistance to 55,000 Great Plains farmers and ranchers in treating critically eroded farmland and making appropriate land use changes.

The hazardous climate and easily eroded soil in the 10 Great Plains States require lasting protection of precious soil and water resources. The drought of the 1970's reminded us that we must adequately protect the Plains from wind and water erosion to reduce the likelihood of another disastrous Dust Bowl Era.

Under GPCP, 3- to 10-year agreements with landowners have been the basis for accelerated installation and maintenance of needed conservation practices. Contracts have been written covering about half of the eligible land in the 10 States. But much work remains to combat serious droughts and persistent erosion problems.

Over the next 10 years, SCS and districts should push forward to help even more Great Plains farmers and ranchers plan for and install the most effective conservation practices on their land. At the same time, we need to look closely at the GPCP in the context of our entire range of SCS programs to determine improvements that can make them even more effective conservation tools.



Wind Damages More Than 5.1 Million Acres in Great Plains

Wind damaged almost twice as much land—more than 5.1 million acres—in the Great Plains during November 1979 through May 1980 as it did during the same period a year earlier.

Reports from the 10-State area indicate that wind damaged 5,134,163 acres, up from 2,874,385 acres for the same 7 months in 1979. Accord-

ing to Norman A. Berg, Chief of USDA's Soil Conservation Service, major factors contributing to wind erosion this season were low levels of protective residue, excessive tillage, loose topsoil because of freezing and thawing, and large areas left unseeded because of drought.

Of the total land reported damaged, 95 percent (4,897,593 acres) was cropland; 4 percent (186,243 acres) was rangeland; and 1 percent (50,327 acres) was other land. Texas, with 1,924,693 acres damaged, accounted for 37 percent of the total.

The Southern Plains States were

hardest hit, accounting for 60 percent of the damaged acreage.

Wind also destroyed crops or cover on 783,712 additional acres of land not damaged. Of this total, 73 percent (573,163 acres) was in the Southern Great Plains.

SCS compiles wind erosion reports covering November through May each year, using data supplied by 516 counties in the Great Plains.

Ted Kupelian,
writer-editor,
Information and Public Affairs,
SCS, Washington, D.C.

News Briefs

Scientists Test Use of Ground Penetrating Radar as Soil Survey Tool

The use of a ground penetrating radar (GPR) unit for making soil investigations for soil surveys was demonstrated recently in Florida. The demonstration was part of a cooperative project of the Soil Conservation Service, the National Aeronautics and Space Administration (NASA) at the Kennedy Space Center, and a geophysical consulting firm in Miami, Fla. Where feasible, use of a GPR unit could save time and money in making soil investigations.

In the cooperative project scientists tested a GPR unit for making soil investigations at two locations in central Florida. Both locations included several contrasting soil types. Since SCS soil scientists had previously mapped the areas by walking over the land and taking soil samples with probes and augers, they could compare the GPR data with the information from the soil maps. During the tests, scientists took additional soil

borings at predetermined intervals to refine their interpretations with additional ground truth. Scientists concluded from the tests that the GPR unit accurately measured the depth to and thickness of several kinds of soil horizons.

The test indicated that use of the GPR unit is limited for certain kinds of soil, however. For example, thick clays and saline ground waters severely limit radar wave penetration. But a GPR unit can determine the thickness and character of the underlying material in peat bogs and locate finer-textured material in sandy sediments and bedrock under soil material. This capability of the GPR makes it an especially valuable tool for making soil investigations throughout the country.

SCS is in the process of buying a GPR unit for use in soil investigations. Geologists will use GPR for determining rock lines and locating rock "defects" such as open joints and shallow caverns which would affect engineering activities.



As the ground penetrating radar (GPR) antenna (left, foreground) is towed along the soil surface in making soil surveys, it feeds a continuous stream of electromagnetic pulses to the GPR recorder which produces a graphic image (above) of the underlying soil profile.

Cost-Share Program Boon to Cattle and Wildlife

Farmers and government officials in southern Iowa have teamed together to establish more wildlife habitat under an experimental cost-share program. This program is designed to encourage farmers to seed part of their pasture to warm season grasses that provide improved wildlife cover.

In fall 1979, the Iowa Conservation Commission (ICC) began this program in cooperation with several State and U.S. Department of Agriculture agencies. Farmers who participate are paid up to 50 percent of the cost (not to exceed \$50 an acre) for establishing switchgrass as a warm season pasture for cattle. They may apply for funds to establish 10 to 40 acres of switchgrass.

In the second year, farmers also receive cost-sharing payments not to exceed \$15 an acre to maintain the stand. This money helps pay for nitrogen fertilizer and chemical weed control.

Cadmium Hot Spots

Hot spots of the highly toxic element cadmium may exist along the Coastal Plain of the Southern States. This possibility turned up in the course of gamma aeroradioactivity mapping conducted by the U.S. Geological Survey (USGS).

The USGS aerial mapping crews were searching for deposits of various minerals, including phosphate. When a high rate of radioactivity was noted in certain heavily farmed and fertilized areas as compared with adjacent wooded areas, USGS notified colleagues in the soil survey investigations division (SSID) of the Soil Conservation Service.

Soil scientists are interested in the

In return for the cost-sharing payment, farmers sign a 5-year management contract with the following requirements: (1) no grazing during the establishment year; (2) the stand can be cut for weed control or for hay any time during July and August, but it cannot be clipped lower than 8 inches; (3) during the 4 remaining years, the switchgrass stand can be cut for hay or grazed any time during July and August, but at least an 8-inch stubble must be left; and (4) seed may also be harvested when mature.

These requirements are needed to assure that the program goals are met.

ICC Biologists Ron George and Jack Coffey explain about the program, "When grassland is undisturbed during May and June, we get significant nesting by pheasants, nongame songbirds, rabbits, and other mammals. Cool season forages, such as bromegrass and alfalfa, don't work well for this purpose. They are usually harvested during

whereabouts of phosphate deposits for two reasons: soils high in phosphate usually are fertile, and such soils generally contain cadmium.

Cadmium-rich soils must be carefully managed to prevent the buildup of this toxic element in food crops. Lettuce and other leafy vegetables, for example, are known cadmium accumulators. Maintaining a higher pH by liming when growing leafy vegetables on affected soils reduces the cadmium uptake.

Eating large amounts of cadmium over time is known to cause changes in the human kidney. People so affected may succumb to kidney failure.

SCS will check the high radiation areas associated with phosphate deposits for high cadmium levels. Soil

nesting season, and many birds are killed or lose their nests.

"Switchgrass can be part of a pasture management system that uses both cool season and warm season grasses to provide continuous grazing during the growing season. This fits into the farmer's management system quite nicely, and wildlife benefit by the increase in undisturbed habitat."

In its pilot year, the program was offered in only seven counties. The ICC hopes to get about 300 acres of switchgrass pasture established in each county. If it is successful, the program will be continued for 10 years and expanded to nearly 40 counties in southern Iowa.

The ICC has received technical assistance from the Soil Conservation Service in setting up and operating the program, and the soil conservation districts have been instrumental in promoting it. Funding for the project comes from the sale of \$3 wildlife habitat stamps that all hunters and trappers must buy.

samples will be collected in three States: Virginia, South Carolina, and Florida. Wherever this problem exists, SCS and USGS will cooperate in mapping the hot spots and notifying appropriate action agencies.

The hot-spot survey is an offshoot of a 4-year national cooperative study begun by SSID in 1979 to determine background levels of cadmium and lead in 19 food crops and the soils in which they grow in 34 States.

SCS is directing the study under an interagency agreement with USDA's Science and Education Administration-Agricultural Research; the Food and Drug Administration (FDA); and the U.S. Environmental Protection Agency (EPA). FDA and EPA need information on background levels so

Switchgrass makes excellent nesting cover for pheasants.



One expected benefit will be a reduction in erosion and sediment damage. Farmers having land in the watersheds of State-owned lakes will have a high priority for funds in an effort to reduce sediment damages and improve water quality.

Lyle Asell,
biologist, SCS, Des Moines, Iowa.

James B. Wooley,
wildlife research biologist,
Iowa Conservation Commission, Chariton, Iowa.

that they can set maximum allowable safe limits of these heavy metals in food crops and in soils receiving sludge.

SCS soil scientists collected soil and plant samples for analysis at 500 sites last year. Soil samples are being analyzed at the SCS National Soil Survey Laboratory, Lincoln, Nebr.; and plant samples, at an FDA laboratory in Cincinnati, Ohio.

Crop and soil samples will be collected from a total of about 6,000 plots for analysis.

Nadine Pitts,
writer-editor, Information and Public Affairs,
SCS, Washington, D.C.

Russell Kanluka,
public information officer, SCS, Orono, Maine.

The Conservation Mile

There is a quiet country road in Hudson, Iowa, that is the pride of an earnest group of high school students. Strayer Road was renamed "The Conservation Mile" last summer because of the efforts of these students, members of the Hudson Future

Farmers of America (FFA). Actually 2½ miles long, the road is a string of farms whose owners have been working to reduce soil erosion.

During winter 1979, the students asked the farmers to help the public learn about soil conservation. The students worked with the farmers, Soil Conservation Service technicians, and Black Hawk Soil Conservation District commissioners to compile soil loss data and cropping information on each farm. They then made signs showing basic information on each participating farm and placed the signs along the road.

Hudson vocational instructors and FFA advisors, Ron Ressler and Steve Sandman said, "The purpose is to draw attention to how much soil we're losing and what can be done about it.

I hope the students and others will look at The Conservation Mile and start thinking about new methods which can be used to reduce soil losses." They feel the students have already gained much from the exercise that will be useful for the entire community.

The project developed in a vocational agriculture class on soil conservation. The students were shocked to learn that soil loss, countywide, amounted to an average of nearly 8 tons per acre annually. Generally, when land loses more than 5 tons of soil per acre, soil is being lost faster than it is replenished.

Eventually, more than 50 students became involved in this project. They selected sites which had the same soil type and slope in order to show the effectiveness of various management and soil conservation practices. Over several class periods the students calculated soil loss using the Universal Soil Loss Equation.

To tell their story, the students painted one large sign explaining the project and placed it on the road just

off the highway where the project started. Eight smaller signs were posted showing the site number, tillage method, crop rotation, and tons of soil loss per acre annually.

During spring and summer of 1979, this unique stretch of gravel road was viewed by eight bus tours of students, adults, Chamber of Commerce members, soil conservation district commissioners, and the County Board of Supervisors. The FFA distributed sheets containing a map and explanation of the project. According to the farmers many people also took the tour on their own.

The soil conservation district and the FFA chapter have had several inquiries from local farmers interested in finding out what they might do on their farms to reduce soil erosion. One of the nice things about this project is that it can continue as long as there is interest. And, of course, the students will carry this lesson with them forever.

J. Barton McAninch,
district conservationist, SCS, Waterloo, Iowa.

Honor System Works on "Pick-Your-Own" Conservation Farm

E. B. Averett of Granville County, N.C., runs a highly successful "pick-your-own" farm on the honor system. When the warm weather arrives, so do the customers. People go out into the fields, pick the fruit or vegetables they want, look at the price list, and weigh their own produce, leaving the money in a box.

Are the customers honest? "They're not only honest," says Averett, "but they often pay me more than the price list says. In addition, if people don't have enough money,

they'll leave an I.O.U. in the box. They always come back later and pay."

Averett's innovative thinking doesn't start at the marketing end of his operation—he's constantly improving his 600-acre farm with the application of new conservation methods. He uses his best farmland for the truck farm fruits and vegetables, and the more erodible land for tree and grass crops. The land is well protected by cover crops which Averett rotates with the regular crops.

Plantings include sericea lespedeza, shrub lespedeza, orchardgrass, and clover. To provide food for wildlife, he plants millet, bicolor lespedeza, nandina, cowpeas, and soybeans—and

Red Ryder and SCS Save the Day

Soil conservation isn't always serious, hard work—it has its light side, too. This was proven in 1950 when a Colorado conservation district official persuaded famous cartoonist and western artist Fred Harmon to make a conservationist out of his cowboy character, Red Ryder. Harmon, also a rancher at Pecos Springs, Colo., and a conservation advocate, took to the idea and created a popular adventure story that unfolded frame after frame in the daily *Denver Post*.

Through his comic strip, Harmon delivered a friendly and educational message of soil and water conser-

vation to millions of readers. The characters include the hero, Red Ryder, and his sidekick, Little Beaver; poor Widow Mason; the swindler, Mr. Hooker; local soil conservationist, Timothy Acres; and, of course, the Old Brown Ranch.

The story is about a widow from the East and her two children who are tricked into spending their entire fortune on a wornout, eroded, and worthless ranch. After failing to get the widow's money back, Red Ryder turns to the Soil Conservation Service for help. With resource inventories and a soil conservation plan, the widow's ranch is restored to its former productive state.

The comic strips are now a collector's item. Don Hansen, USDA Forest Service manager of the "Smokey the Bear" and "Woodsy Owl" campaigns, discovered copies of the comic strips in an old USDA file and gave them to Doug Sellars of SCS's Resource Planning Branch in Washington, D.C. Sellars saw an opportunity for bringing attention to conservation and range management and presented them to the Society for Range Management at its February 1980 annual meeting. The comic strips were auctioned off for \$250, which will be used by the society in support of its range management efforts.



the farm abounds with birds and small game.

Averett recently signed an agreement with the U.S. Department of Agriculture (USDA) Agricultural Stabilization and Conservation Service and the Soil Conservation Service to do additional conservation work on the farm over the next 4 years. The agreement includes: (1) critical area treatment to slope and seed road-banks for erosion, (2) planting the less productive cropland to hay, and (3) installing parallel terraces, grassed waterways, and field borders.

The "pick-your-own farm" is such a showplace that North Carolina State

University scientists often hold demonstrations in the peach orchards. Averett plants several varieties of peaches so that the fruit is available for a longer period of time.

E. B. Averett comes by his conservation work naturally. For the past 17 years, he has served as a supervisor of the Granville Soil and Water Conservation District and is currently vice-chairman. Acting as liaison between the district and USDA agencies, Averett is an enthusiastic supporter of conservation in the county.

He is also an active member of the Granville County Forestry Club and works with the USDA Forest Service and with an Extension Service fores-

ter in doing woodland management on his own farm.

To expand his operation, Averett is growing Christmas trees, including spruce, pine, and cedar, as well as outdoor flowers and hothouse plants. These too will be sold on the honor system.

As Boyce Harvey, SCS district conservationist, puts it, "The farm is so popular that you have to keep in touch with Averett to find out the exact day that the crop will be ready for harvesting. If you don't get there early, you just don't get any!"

Frank Jeter, Jr.,
public information officer, SCS, Raleigh, N.C.

Touring Idaho

Adetailed tour guide to 106 conservation farms and ranches in Idaho has been published by the Soil Conservation Service State office at Boise.

Each listing gives the landowner's name, address, district, and county and explains how to reach the site. The conservation practices on view are described briefly.

Titled "Directory of Visible Conservation," the book is intended for use at State, area, and field office levels. Cooperators included in the directory were selected by each Idaho district conservationist. Criteria for selection included:

- Site easily accessible from main roads in a short time;
- Systems planned with SCS assistance;
- Installation according to SCS standards and specifications.

SCS State Conservationist Amos Garrison said he believes the directory will prove particularly useful at the area level for planning inter-agency tours and similar outings.

In Cassia County, visitors to Raymond Johnson's dryland wheat farm can study results of a \$40,000 terrace-building project, developed under a 10-year long-term agreement, to reduce soil erosion, conserve moisture, and improve water quality.



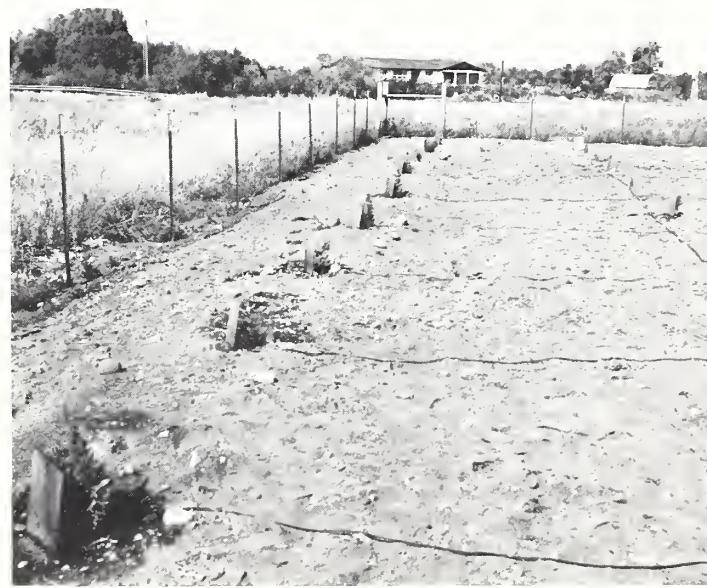
Visitors to the East Daniels Critical Area Treatment area in Oneida County can see how a combination of terraces, contouring, and other practices have helped a group of farmers to solve severe erosion problems, including gullying. Here equipment works a 30-inch terrace on the contour, with small sweeps.





Left, winding grassed waterways provide runoff protection for 214 cropland acres on Ray Gormsen's farm in Latah County.

Right, a new windbreak of 45 juniper, blue spruce, and honey locust trees is watered with a trickle irrigation system on the Douglas Paynter farm. The system includes 150 feet of half-inch supply line and 375 feet of "spaghetti" hose, which runs to each tree. The Fremont County irrigation system cost 20 cents per foot to install in 1978.



245 Survey Team Monitors Lake Sediment

by Bruce Hennie

A Soil Conservation Service team is navigating the waters of 35 Texas small watershed lakes to measure sediment buildup. The survey team, headed by SCS Geologist Bobby Johnson and working out of Fort Worth, also determine factors that have an effect on sedimentation rates such as rainfall, new conservation practices installed, and land use changes since the previous survey.

To measure the sediment, team members work from a grid map on which they draw a base line across one end of the lake. They then draw "range" lines perpendicular to the base line the length of the lake starting at the emergency spillway crest elevation.

"When we get to the site, we string a steel cable across the lake to cor-

respond with one of the range lines," said Johnson. "We attach the boat to the cable which has a line meter to keep track of horizontal distances.

"A fathometer in the boat takes continuous soundings," Johnson explained. "The fathometer works by the same principle as sonar—bouncing sound waves off the lake floor. As the boat moves across the water, the fathometer sketches out a graph of the lake bottom."

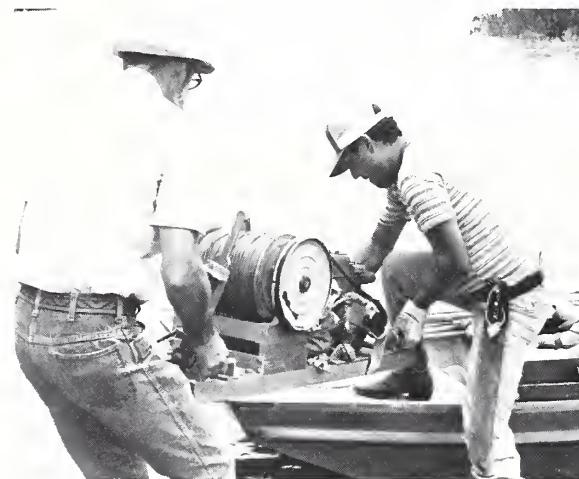
This process is repeated until all range lines have been followed. Later, the team members take verification measurements manually at random points. They also measure the sediment for depth, and collect a sample for lab analysis to determine its makeup and source. Each lake is surveyed at 5-year intervals.

"Working outdoors is great most of the time," said Johnson, "but it limits us in the winter. We use that time to tabulate raw data collected from the previous summer. A contour map is made of each lake site from which we calculate the loss in capacity due to sedimentation during the last 5-year period. We also conduct upland studies to determine changes in land use; conservation practices applied; and gully, streambank, roadside, and construction erosion. A summary sheet is then completed which compares this information to that contained in previous surveys."

One of the lakes, "Site 17," is in the Denton Creek watershed, about 10 miles northwest of Decatur, Tex. It was rangeland until about 80 years ago, when it was plowed under and



SCS Civil Engineering Technician Roscoe Graham, left, and Survey Leader Bobby Johnson study maps made of previous sediment surveys to plan the base line layout. Base lines are located on permanently marked cross sections.



Johnson and Edward Gutierrez, a summer employee, load a cable rig onto the boat. Cables are strung from shore to shore to correspond with the range lines on the map.



Johnson and Graham rig up a fathometer in the boat. The cable runs through a line meter (on the left side of the boat) so horizontal distance can be measured.

heavily cropped to cotton. In the 1920's, it was clean-tilled to peanuts, and the fragile soil finally just gave way.

Gullies developed that were among the most severe in the Nation. Massive erosion and runoff polluted streams, caused frequent flooding, and endangered Dallas-Fort Worth water supplies a few miles away.

In 1962, the Denton Creek dam was completed. Where gullies once formed, the land is now in grassland and woodland. Only 11 percent of the land in the area is suitable for crops.

During the 12-year period after the small watershed project was completed, sediment deposits in the lake averaged 2.5 acre feet per square mile annually, or a sediment yield of 6 tons of soil per acre per year. Ac-

cording to the last sediment survey taken in April 1979, sediment deposits had decreased to 1.7 acre feet per square mile per year, or a yield of approximately 3 tons of soil per acre lost every year.

Johnson attributes the decrease in sedimentation to a combination of the Site 17 flood prevention project, farmers' getting help with conservation work under the Great Plains Conservation Program, and other critical area treatment around Decatur.

In addition to the small watershed lakes, the survey team monitors several municipal reservoirs. These data can be used in municipal planning for water supplies, recreation, and downstream flood protection.

The information is helpful to wa-

tershed designers who must know how much area and volume to allow in building new sediment collecting pools, dams, and lakes. The data are also used nationwide in trap efficiency studies to determine the amount of sediment that will stay in the reservoir and not pass through the spillway, and in delivery ratio predictions, the amount of sediment that reaches the reservoir from upland. Finally, conservation planners can review the team's findings to determine how effective their erosion control theories have been "on the ground."

Bruce Hennie,
former public information trainee, SCS,
Temple, Tex.



As the boat moves across the water, the fathometer sketches a profile of the lake. The dip in this profile shows an old stream channel.



Graham marks the fathometer tape to show the distance from the base line.



Graham pushes a sediment probe through a layer of mud to the original lake bottom. This depth is recorded by a notekeeper. Sediment samples are taken for lab analysis.

Range Management Increases Grass Production

by Mike Stirling

Good range management does not just happen—a rancher must work at it. That is exactly what Danny and Kaye O'Connell of Creghton, S. Dak., have done. They've taken an old run-down horse ranch, in the rolling river breaks of the Cheyenne River, and turned it into a productive cow/calf, yearling operation.

In 1959, O'Connell realized his ranch could be more productive and sought help from Ralph Cole, range conservationist with the Soil Conservation Service. He was weaning his calves at 370 pounds and selling 730-pound yearlings. Today, O'Connell weans 500 pound calves and sells 900-pound yearlings.

O'Connell has kept production records and has used artificial insemination for the past 15 years. His grass management has complemented the management of his livestock, which depend on native grasses for year-round grazing. The forage is augmented in the winter with a protein supplement and ear corn. He only feeds hay when the weather conditions are severe.

Deferred grazing has been an important part of his range management. Every year a selected pasture is left ungrazed. "This allows the grass stand to thicken up and is good insurance for a dry year," reports O'Connell. During the dry years, in the mid seventies, O'Connell was able to maintain his cow herd when many operators were forced to liquidate or drastically reduce theirs.

In the 1960's, O'Connell contour furrowed about 500 acres of range-land to speed up recovery from past hard use. The furrows were 42 inches from center to center, 8 inches deep, and 10 inches wide. "These are more severe than normal furrows," O'Connell said, "but they are more permanent."

However, O'Connell and his wife Kaye are quick to point out that furrowing is not the whole solution. Once completed, the area has to be left ungrazed for at least two growing seasons. This allows the western wheatgrass to spread into the furrows. The furrowing and shading from the taller western wheatgrass reduces the stand of less productive short grass. Periodic deferment over the years and management of grazing—using only one-half of the current year's growth—have doubled grass production on the furrowed land. The standing grass also catches snow which provides additional moisture.

Each furrow acts as a small terrace, and runoff is almost eliminated from the furrowed area. "You have to be careful where you furrow," said O'Connell; "you can dry up water impoundments with the practice."

Water impoundments are important to the O'Connell operation. "Deep impoundments are needed to get through dry years," O'Connell said. He also points out that good spacing of his impoundments has helped distribute grazing. Stock pipes through the embankments supply tanks with water in the winter pastures.

The extra water and excellent grass cover have provided additional wildlife habitat. Canadian geese and ducks make use of the water impoundments for raising their young. Sharp-tailed grouse have responded to the better grass habitat and they can now be found in abundance on the ranch.

In one pasture, O'Connell had a problem with fringed sagewort. This pasture was sprayed and then deferred for 2 years during the growing season. The pasture's production increased, and it is now producing at optimum.

O'Connell has built cross fences to help in distribution of grazing. He says that this also makes it easier to leave a pasture ungrazed for a growing season so the grasses can become more vigorous.

In 1961, O'Connell became the first cooperator of the Eastern Pennington Conservation District to participate in the Great Plains Conservation Program (GPCP). Through the GPCP, SCS provided cost sharing and technical help to O'Connell on the conservation practices he completed.

The O'Connell's have been recognized for their accomplishments. They won the South Dakota Range-man of the Year Award in 1978. This award is sponsored by the South Dakota Section of the Society for Range Management.

Range management, conservation practices, and production testing have been effective tools on this ranch. With the O'Connell's well-managed ranching operation, their ranch will be able to efficiently produce beef for years to come.

Mike Stirling,
district conservationist, SCS, Wall, S. Dak.

Adapted from an article in the September 1979 issue of *Dakota Farmer*.

Responses to the Soil and Water Resources Conservation Act (RCA) during the 60-day public review period came from every State of the Union and Puerto Rico. Nearly 60 percent of the responses were submitted on structured response forms. All told, 82 different response forms were received, accounting for nearly 40,000 responses. Respondents to RCA provided over 1.5 million identifiable comments, discussing a wide variety of ideas, issues, and items. Many of the responses carried more than one signature, resulting in over 120,000 people being represented in the RCA comment process. More than 74,000 signatures were obtained on structured response forms alone.

The most frequently received comments were aimed at the seven alternative strategies followed by the proposed conservation objectives. The assumptions and projections and present USDA conservation programs were also frequently addressed.

In order to capture an overview of the "type" of people and organizations that responded during the 60-day RCA public review period, analysts at the Response Analysis Center used 17 categories to represent occupational, personal, and or-

ganizational affiliations. Every effort was made to place each respondent in the most descriptive "respondent" category.

The "respondent types" used in the coding and evaluation were: academic, agribusiness, business/industry, civic/social, commodity organization, environmental/conservation, farm organizations, Federal Government, individual, industry/trade group, labor organization, local government, minority organization, State government, youth organization, other groups, and other. The letterhead, signature, or body of the response oftentimes indicated the appropriate affiliation of respondents.

If an affiliation determination could not be made, the respondent would be placed in either the "other groups" or "other" categories. The number of those being placed in the "other groups" and "other" categories was very small. This indicates that respondents stated their affiliations in a manner that could be captured during the coding operation.

To provide background as to who was included in a category, the following will clarify some of the most commonly asked questions about affiliation coding.

Who would be included in the agribusiness category? Businesses engaged in agriculture as a primary economic activity. This would include chemical companies; food sales; processing; storage, seed, fertilizer, and feed sales; and timber operations.

Who would be coded into the commodity respondent affiliation code? This grouping is primarily for individuals or organizations who indicated that they grow or process a certain agricultural commodity such as cattle, corn, wheat, dairy, tobacco, vegetables, etc.

The environmental conservation classification would consist of those people and organizations clearly associated with such groups as Audubon Society, Izaak Walton League, National Association of Conservation Districts, Sierra Club, etc.

Respondents in the Federal Government category consisted of both individual Federal employees and agencies writing in response to RCA.

Individuals consisted of those who did not mention any other affiliation or those who stated their affiliation only as farmer/rancher, homemaker, student, military, teacher, etc.

Bureau of Reclamation Renamed

After nearly 78 years as the "Reclamation Service" and the "Bureau of Reclamation," the agency that built Hoover Dam and Grand Coulee Dam, among others, has been renamed the Water and Power Resources Service (WPRS).

"The initial purpose of reclaiming arid western lands has expanded to a much broader responsibility for water

and power resource management," said R. Keith Higginson, WPRS Commissioner.

Water supply from early reclamation features was primarily for irrigation. Today, said Higginson, much project water augments domestic and industrial supplies and overall water quality is improved. Increased irrigation efficiency, water conservation, and the reclamation of wastewater will be required in the future to meet expanding needs.

WPRS has responsibilities for 138 water and power projects, with 333 reservoirs. These supply some or all of the water used by more than 16 million people, 30 percent of the population of the 17 Western States.

This change gives the agency a name which identifies it with its principal functions—supplying water and power.

Management Tips

Readers are invited to submit "Management Tips" to the editor, *Soil and Water Conservation News*, Soil Conservation Service, P.O. Box 2890, Washington, D.C. 20013.

Solving Erosion, Sedimentation, and Storm Water Problems

How does your conservation district handle erosion, sediment pollution, or surface water damage complaints? Determining the best approach may vary with each situation and may present a real problem. In all cases understanding the conditions that brought on the complaint, good salesmanship practices to convince the land user he or she can benefit by correcting the problem, and judicious restraint in wielding the enforcement club are prime requirements to complaint resolution.

Conservation districts respond to complaints with a wide range of actions ranging from practically ignoring them to immediate onsite inspections and sometimes attempts to fine the violating landowners. Each type of response may be the correct one for that particular complaint. Some complaints may be received from chronic complainers and the district may know that no problem exists. Others may range to critical situations where immediate action is warranted.

One conservation district has developed a system that has worked well for them and allowed them to resolve numerous problems in a friendly, helpful way.

When a valid complaint is received, an onsite inspection is made and the cause of the problem identified. The offending landowner is sent a low-key, friendly letter pointing out the problem to his or her own property and to adjacent properties. The benefits of installing conservation practices, such as rainwater detention, soil retention, and minimizing damages to neighboring property, are explained. A short outline of the erosion and sedimentation process, an explanation of how the district could

help, some publications on farm plans, other favorable articles on conservation, and a cooperator agreement open the way for the landowner to respond voluntarily.

The letter doesn't say the landowner violated the law, it doesn't threaten to report him or her to the Department of Environmental Resources, and it doesn't put him or her on the defensive. It does report a problem and offers assistance. Hard sell and enforcement letters are sent only as a last resort.

Why not discuss drafting a sample letter with your Bureau of Soil and Water Conservation field representative and set up your own soft sell program? It has worked for others, it should work for you.

Reprinted with permission from the March-April 1980 issue of *Teamwork*, published by the Pennsylvania State Conservation Commission, Department of Environmental Resources, Harrisburg, Pa.

Stream Inventories Mean Better Management

Stream inventories in Montana are providing baseline information to land users and resource managers to develop and implement sound management practices.

The first comprehensive inventory was published in 1977. Since then four other reports have been produced.

Developed at the request of conservation districts, these inventories are usually conducted by a team of representatives from the Montana Department of Fish, Wildlife, and Parks; U.S. Department of the Interior's Fish and Wildlife Service; and USDA's Soil Conservation Service.

Robin Street, past chairperson of the Flathead Soil Conservation District in northwestern Montana, explains, "The stream inventory gives us the ability to look at the whole

picture. It makes people realize the problems and encourages them to move ahead to solve them."

Professional resource managers find the inventories useful, too.

Don Peters, fisheries biologist for the Montana Department of Fish, Wildlife, and Parks says of his experience on the Bitterroot River Inventory, "I was impressed. I learned a tremendous amount about the river. It really assists us in relating our very detailed studies on small sections into the needs of the entire river."

By walking and floating the streams, the team identifies streambank and channel alterations, eroding banks, critical sediment sources, streambank vegetation, streambed material, pools, riffles, obstructions, and debris. Items identified vary depending on the stream to be inventoried and its particular problems. These areas are noted on aerial photographs.

From this data base, a written report is prepared which details the findings and offers management recommendations.

Street explains, "We may not always agree with the recommendations, but they give us a chance to start talking. These reports would be useless if the team did not give us their honest assessment of what is occurring and how to correct it."

Stream inventories give resource managers the opportunity to work cooperatively with landowners in treating their resources. This not only assists landowners in protecting and using valuable land properly, but it also preserves other important attributes of the river system such as water quality and fish and wildlife habitat.

Tom Ganser,
area biologist, SCS, Missoula, Mont.

CONSERVATION Research Roundup

Pollution Solution

Shrimp and crab wastes, once dumped into Oregon's bays, are now being sold to farmers for fertilizers.

In July 1977, the Federal Water Pollution Control Act banned Oregon seafood processors' long-held practice of dumping crab and shrimp processing byproducts into Oregon's bays. The ban forced the seafood industry to find a new place to throw away the 15 to 30 million pounds of wastes it produces annually.

Oregon State University's Agricultural Experiment Station undertook a project to help solve the seafood industry's problem. Analyses conducted by researcher Bob Costa indicated that a ton of shrimp and crab wastes contained 26 to 32 pounds of nitrogen, 22 pounds of phosphate, and smaller amounts of potash, sulphur, magnesium, and boron. In addition, shrimp and crab shells in the wastes are a good source of lime. On a per-ton basis, crab wastes contained 300 pounds of lime, and shrimp wastes contained 130 pounds.

In a field trial on an orchardgrass pasture near Toledo, Oreg., the researcher recorded a 6.1-ton yield of hay on an acre fertilized with 3 tons of shrimp wastes. He estimates that it would have taken about 400 pounds of commercial fertilizer to achieve the same yield.

From the results of greenhouse experiments, the researcher calculated that 3 to 8 tons of shrimp wastes per acre would adequately meet the nitrogen needs of pasture grass, and 3 tons per acre would supply enough nitrogen for clover pastures.

Costa concluded that the processing wastes were a suitable source of nitrogen, phosphorus, and lime for several crops. Farmers apparently agreed. The demand for seafood

processing wastes in several coastal counties soon exceeded the supply.

In Lincoln County, a Coastal Farmers Cooperative was organized to take advantage of the resource and, according to former Lincoln County Extension Agent John Fitzpatrick, demand for the wastes remains strong. Farmers pay \$6 a ton for the wastes, which Fitzpatrick estimates has the same nutrient value as \$12 to \$15 worth of commercial, inorganic fertilizer. He adds that lime in the wastes has helped farmers cope with extremely acid soils.

Adapted from an article in *Oregon's Agricultural Progress*, Agricultural Experiment Station, Oregon State University, Corvallis, Oreg.

Compost Aids in Reclaiming Salt-Damaged Soils

The results of work done by researchers at the University of Arkansas Agricultural Experiment Station indicate that composted organic matter can be an effective amendment to soils that have been damaged by too much salt or sodium.

Irrigation with water high in total dissolved salts or exchangeable sodium can cause salt damage, said University Soil Scientist Les Hileman. The salt buildup and subsequent loss of soil productivity has been a concern of farmers in several areas of the United States for many years.

Certain soil and irrigation management practices, such as installing tile drainage systems, off-season irrigation, and crop rotation plans, will help maintain soil fertility in problem areas, Hileman said. But these practices sometimes may not be enough to restore lost soil fertility.

In several counties in southern Arkansas, approximately 20,000 acres have lost all soil productivity

because of salt and sodium accumulation, the researchers said. During the oil boom of the 1930's, a large amount of saltwater was released into streams and natural watersheds causing loss of vegetation and much soil erosion.

The researchers noted that the few places where grasses had begun to grow were places where a tree had fallen over and the decaying organic matter mixed with the soil. The researchers began their first experiments using composted chicken litter as a soil amendment.

The experiments were conducted from 1971 to 1977. The researchers determined the most efficient level of compost application and the extent to which the soil could be damaged and still reclaimed.

The results showed that compost did improve salt-damaged soil. The success of the method depends on the severity of the damage. Application rates of 2 tons per acre or 4 tons per acre produced the best response.

Solar Pond

Research is underway at the Ohio Agricultural Research and Development Center, Wooster, Ohio, on the utilization of a salt water pond for collection and storage of solar energy. The pond has proven highly stable with limited maintenance required.

Heat exchangers and a heat pump system are used for heat extraction. The system heated part of an adjacent greenhouse during winter 1979-80.

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Meetings

August

3-6	National Farm and Power Equipment Dealers Association, Las Vegas, Nev.
3-6	Soil Conservation Society of America, Dearborn, Mich.
10-15	National Association of County Agricultural Agents, Oklahoma City, Okla.
17-20	American Institute of Chemical Engineers, Portland, Oreg.
18-21	Association of State and Interstate Water Pollution Control Administrators, Burlington, Vt.
25-29	Federal Bar Association, Washington, D.C.

September

3-5	American Water Works Association, Chesapeake Section, Ocean City, Md.
5-7	American Agricultural Economics Association, Denver, Colo.
8-12	Environmental Protection Agency, International Symposium on Inland Waters and Lake Restoration, Portland, Maine
16-20	American Horticultural Society, St. Louis, Mo.
17-19	National Waterways Conference, Tulsa, Okla.
21-23	The Fertilizer Institute, San Francisco, Calif.
21-24	American Fisheries Society, Louisville, Ky.
21-25	Interstate Conference on Water Problems, Cincinnati, Ohio
23-26	National Conference of Editorial Writers, Huntington, W. Va.
24-26	International Association of Fish and Wildlife Agencies, Louisville, Ky.
28-October 1	American Forestry Association, Dixville Notch, N.H.
28-October 3	Water Pollution Control Federation, Las Vegas, Nev.

October

5-8	Society of American Foresters, Spokane, Wash.
6-11	Association of Interpretive Naturalists, Cape Cod, Mass.
11-14	Farm and Industrial Equipment Institute, Boca Raton, Fla.
14-16	Agricultural Research Institute, St. Louis, Mo.
19-23	1980 Congress for Recreation and Parks, Phoenix, Ariz.

New Publications

Water, the Basis of Life

by the Soil Conservation Society of America

This publication is an educational cartoon booklet designed to teach young people about the value of water as a natural resource.

It explains the importance of water to plants, animals, and man; communities; agriculture; and industry. Emphasized throughout the booklet is the protection of water supplies and water quality.

The new booklet replaces an earlier booklet on water in the Society's series of 11 educational cartoon booklets. The

booklets are designed to help young people in the upper elementary grades understand the value and wise use of natural resources. A teacher's guide accompanies each booklet in the series.

Single copies are 35 cents. The accompanying teacher's guide is 25 cents a copy. Prices for quantity purchases are available on request. A set of all 11 booklets is \$3 and a complete set of teacher's guides is \$2.50.

The publications are available from the Soil Conservation Society of America, 7515 Northeast Ankeny Road, Ankeny, Iowa 50021.

Recent Soil Surveys

Published

by the Soil Conservation Service

Arkansas: Randolph County.

Idaho: Benewah County Area.

Illinois: Ogle County and Winnebago and Boone Counties.

Iowa: Franklin County.

Kansas: Mitchell County.

Kentucky: Shelby County.

Louisiana: Rapides County.

Minnesota: Olmsted County.

Montana: Glacier County and Part of Pondera County.

New Jersey: Ocean County.

North Carolina: Greene County and Henderson County.

Texas: Nacogdoches County.

Washington: Washington and Ramsey Counties and Whitman County.

Wisconsin: Kewaunee County.